

(No Model.)

2 Sheets—Sheet 1.

G. GERONIMI & G. VENINI.
CREMATION FURNACE.

No. 361,407.

Patented Apr. 19, 1887.

Fig. 1.

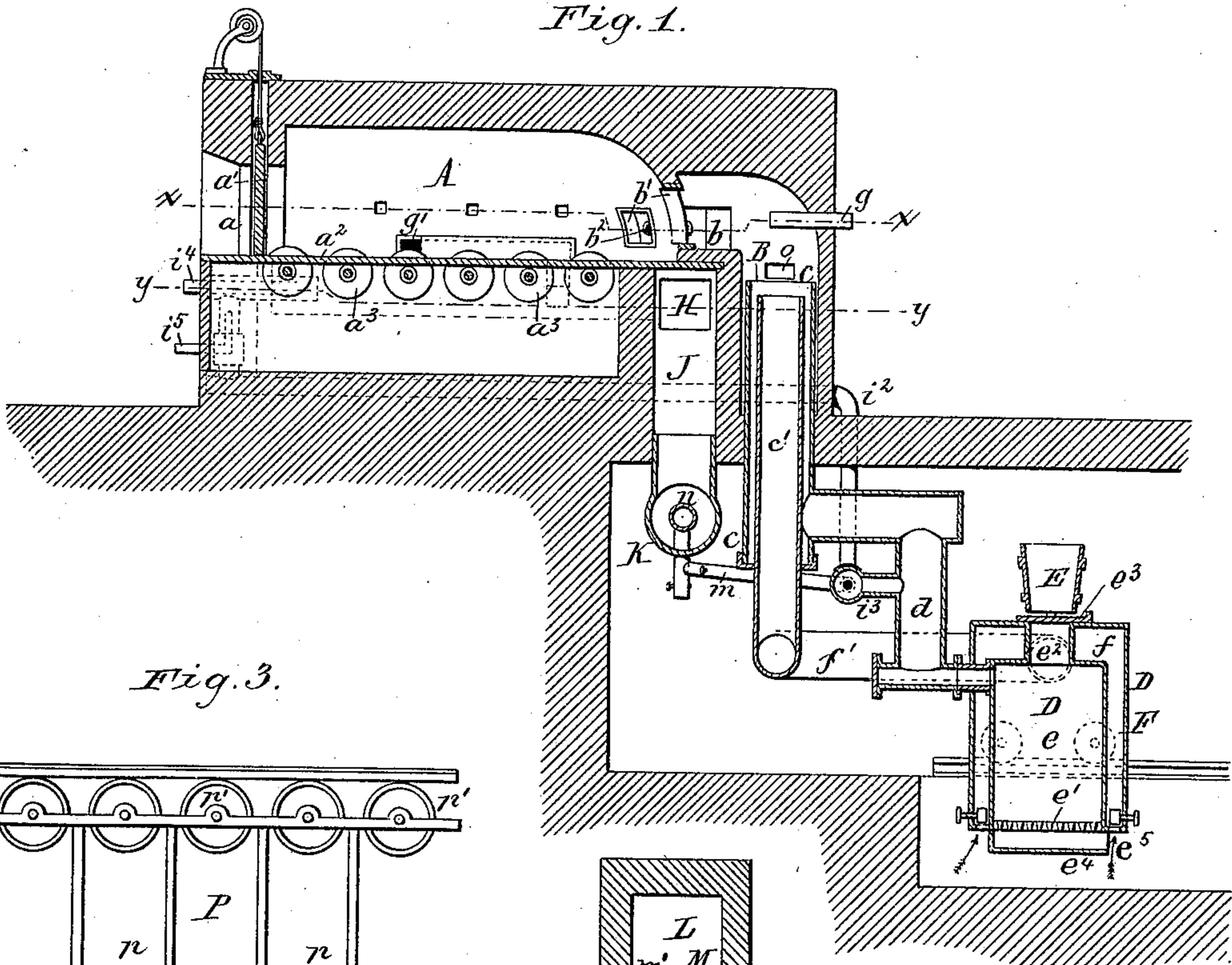


Fig. 3.

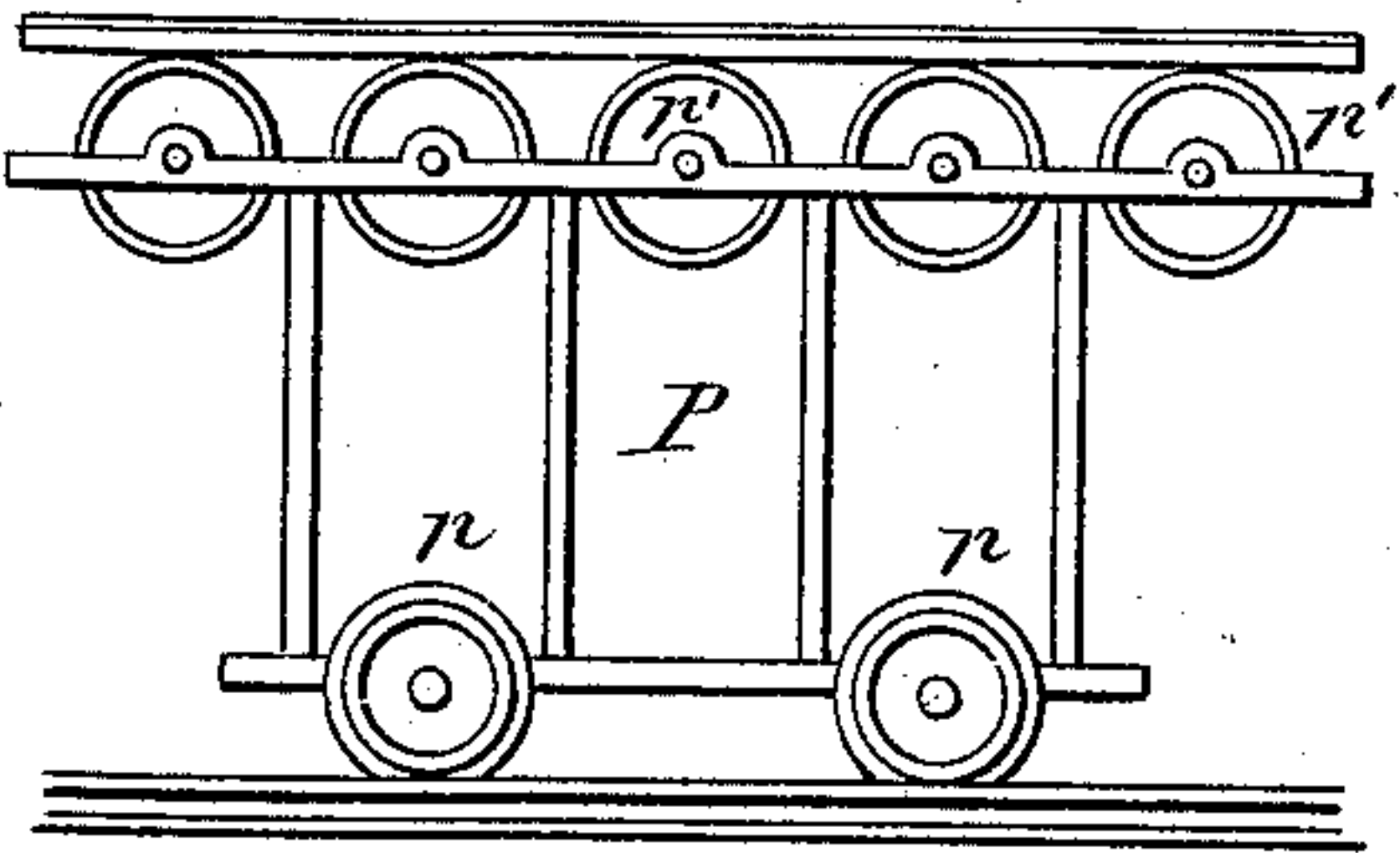
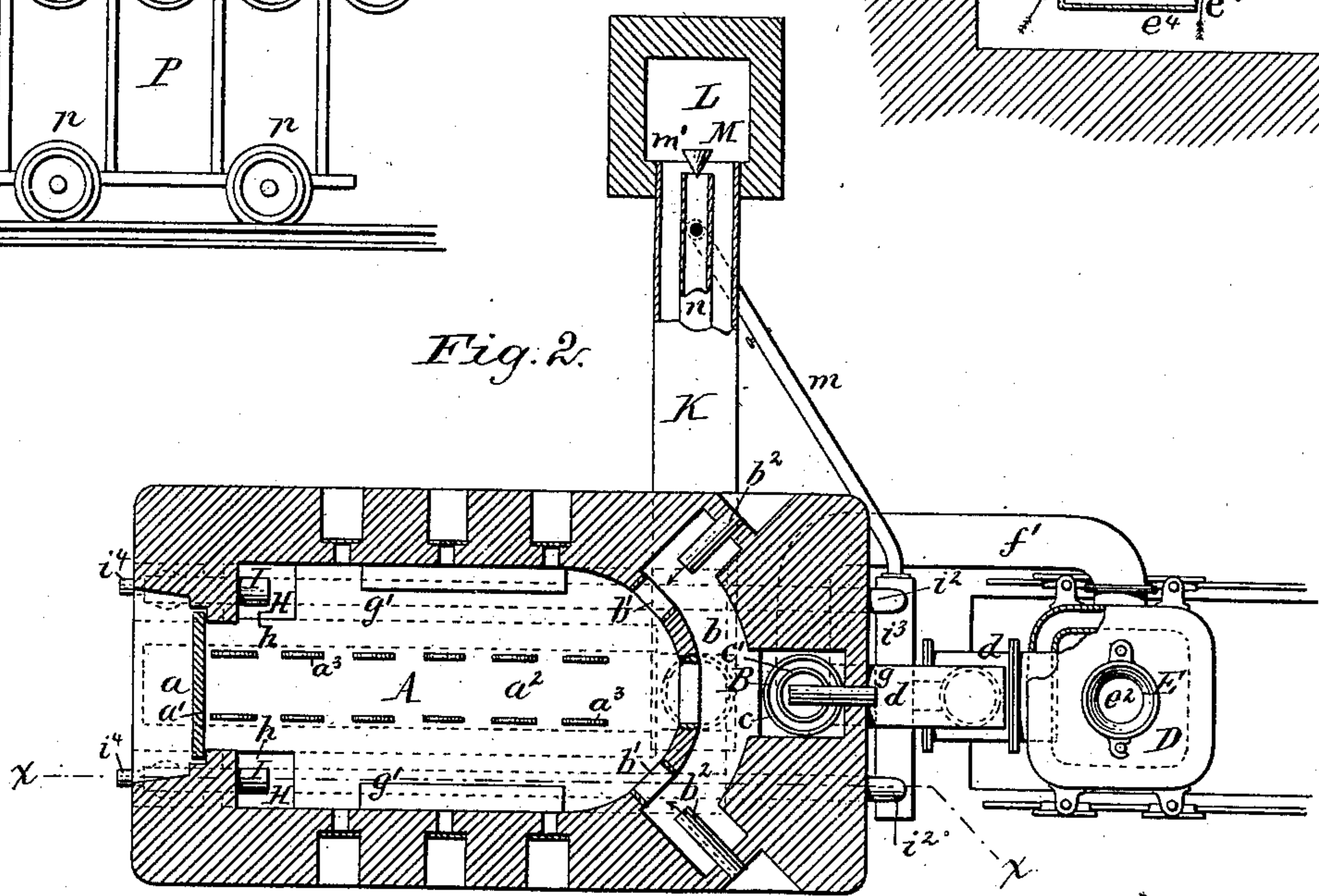


Fig. 2.



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Theodore L. Popp } Witnesses.

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Attorneys.

(No Model.)

2 Sheets—Sheet 2.

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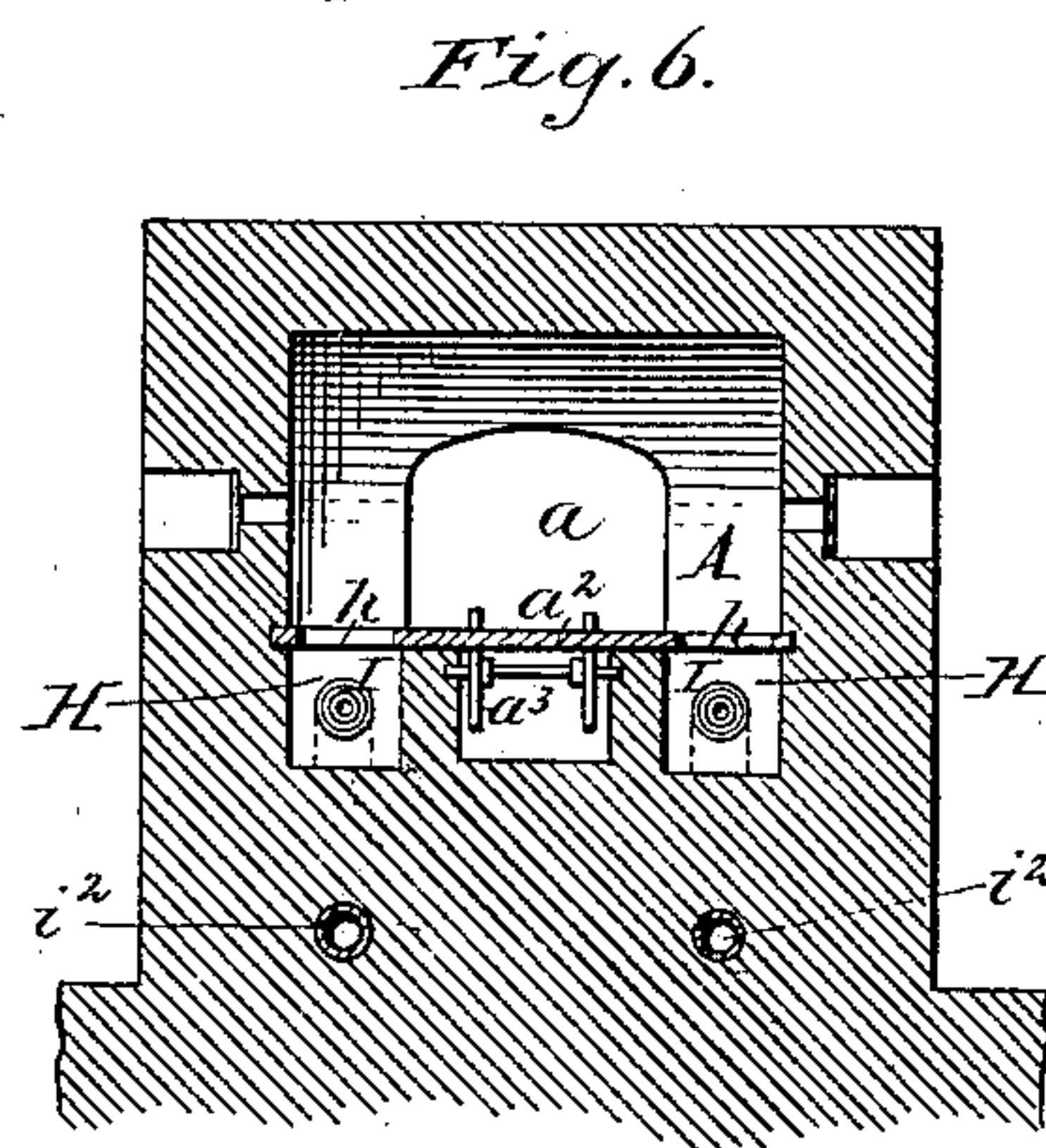
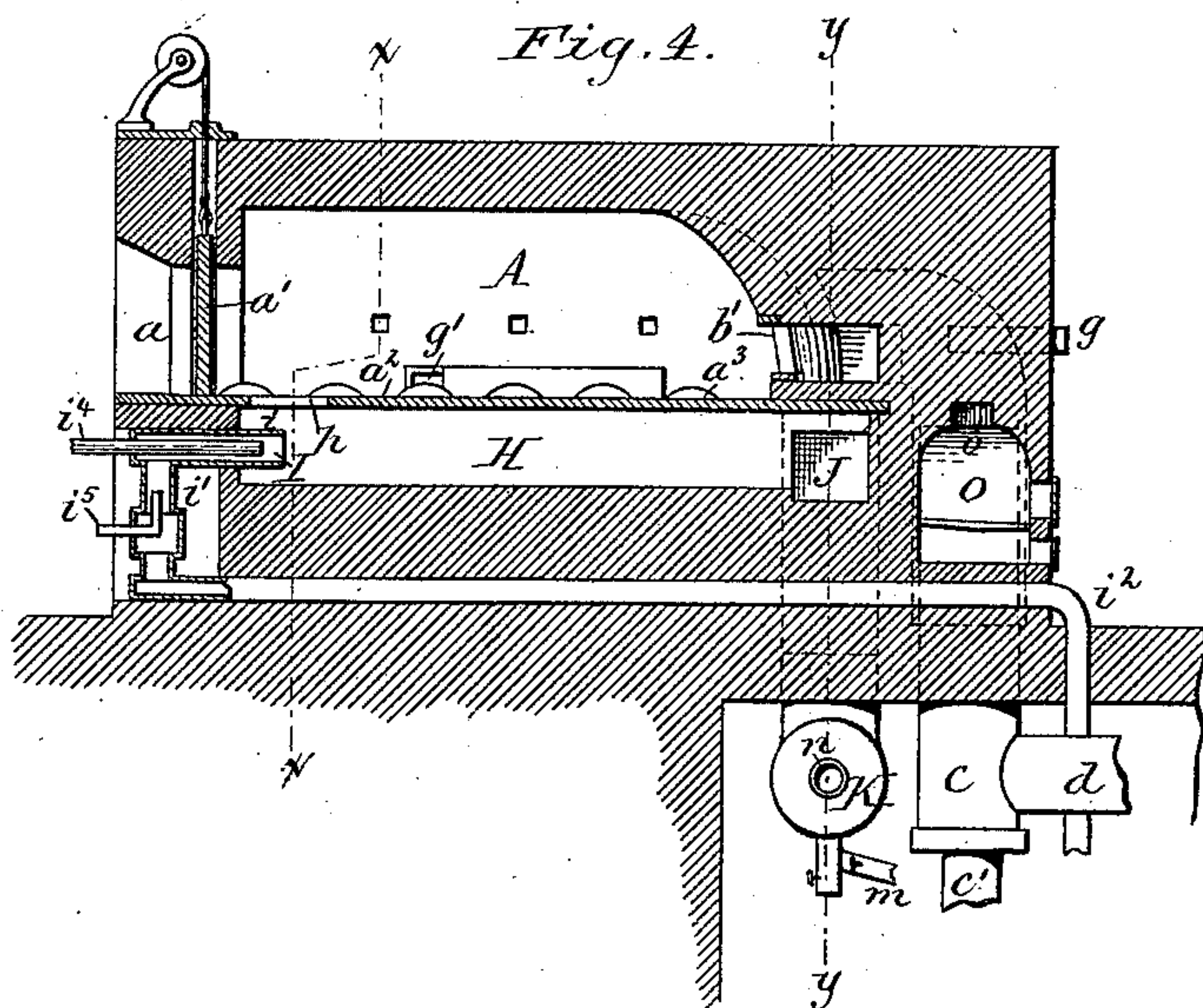


Fig. 7.

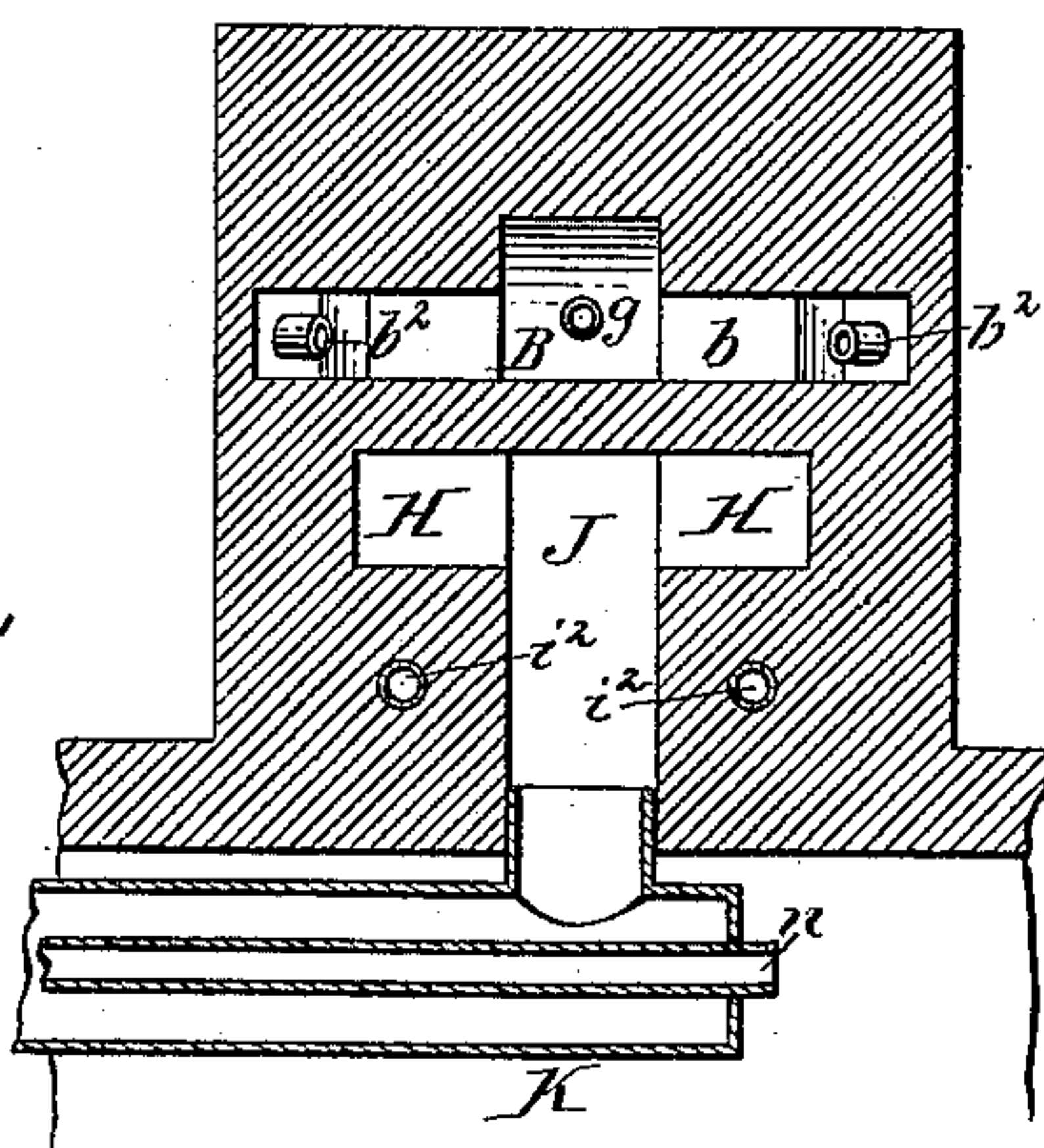
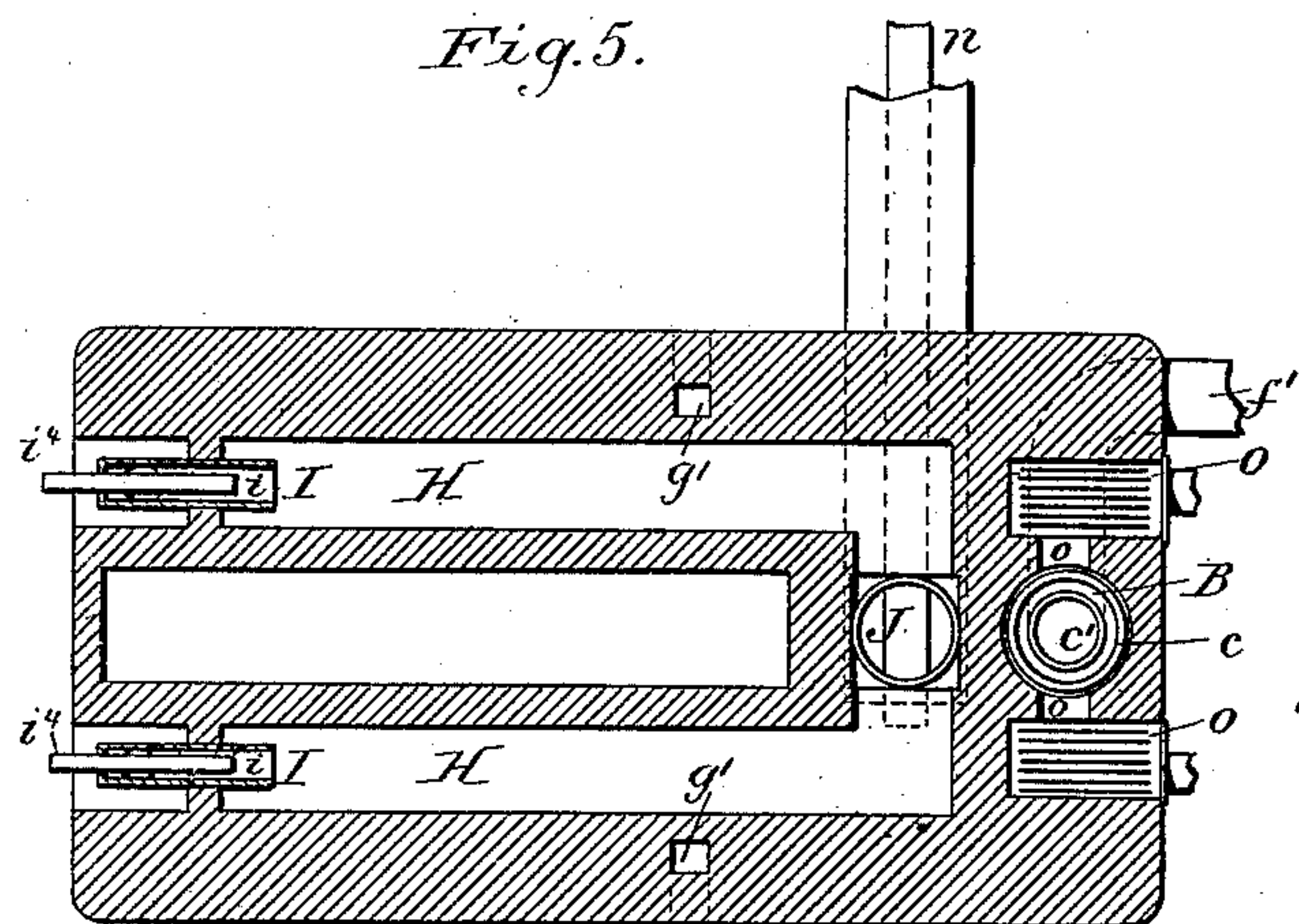
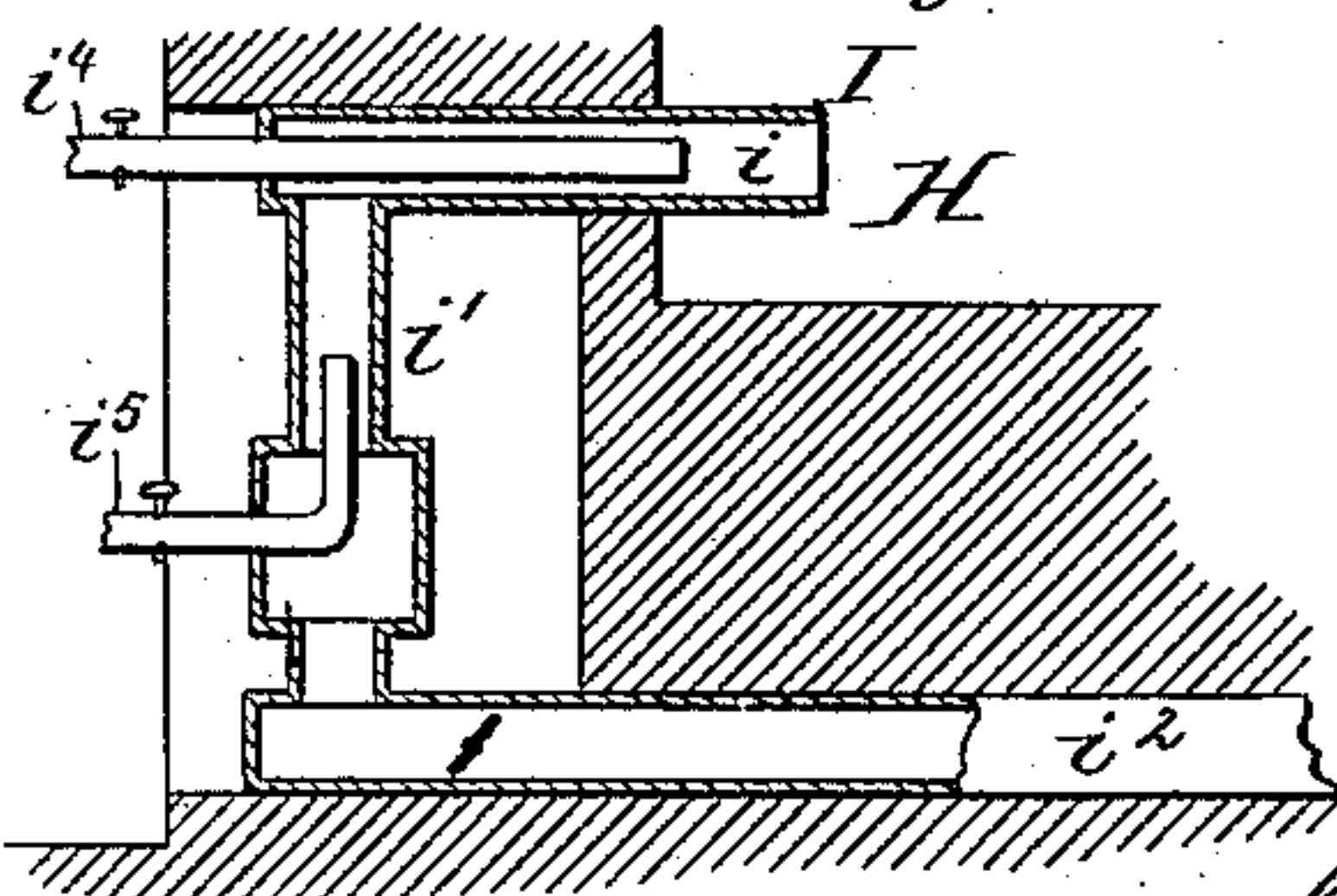


Fig. 8.



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UNITED STATES PATENT OFFICE.

GIUSEPPE GERONIMI AND GIUSEPPE VENINI, OF MILAN, ITALY.

CREMATION-FURNACE.

SPECIFICATION forming part of Letters Patent No. 361,407, dated April 19, 1887.

Application filed January 19, 1886. Serial No. 189,099. (No model.)

To all whom it may concern:

Be it known that we, GIUSEPPE GERONIMI and GIUSEPPE VENINI, subjects of the King of Italy, and residing at Milan, in the Kingdom of Italy, have invented new and useful Improvements in Cremation-Furnaces, of which the following is a specification.

This invention relates to an improvement in cremation-furnaces; and the object of this invention is to produce a compact and simple furnace which produces readily, by means of a combustible gas, the high degree of heat necessary for the successful cremation of corpses, and in which the products of the primary combustion of the corpse are repeatedly subjected to further combustion, whereby all the gases emanating from the burning corpse are completely oxidized and rendered inodorous and harmless before they are emitted into the surrounding atmosphere.

Our invention consists, to these ends, of the improvements in the construction of the cremation-furnace, which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 is a longitudinal central section of our improved cremation-furnace. Fig. 2 is a horizontal section of the same in line $x x$, Fig. 1. Fig. 3 is an elevation of the carriage upon which the corpse is placed. Fig. 4 is a longitudinal sectional elevation in line $x x$, Fig. 2. Fig. 5 is a horizontal section in line $y y$, Fig. 1. Figs. 6 and 7 are cross-sections in line $x x$ and $y y$, Fig. 4, respectively. Fig. 8 is a sectional elevation of the secondary gas-burner on an enlarged scale.

Like letters of reference refer to like parts in the several figures.

A represents the cremation chamber or oven of the furnace, made oblong in form, and having at its front end an opening, a , provided with a vertical sliding door, a' , through which the corpse to be cremated is introduced into the chamber A. The floor or bottom a^2 of the latter is provided with rollers a^3 , for facilitating the movement of the plate or slab upon which the corpse is placed. The combustion-chamber and the passages connected therewith are constructed of fire-brick or other refractory material capable of sustaining the high degree of heat which is maintained in the furnace.

B represents the gas-burner, arranged at the

opposite or rear end of the furnace, and communicating with the cremation-chamber A by a horizontal passage, b , and openings b' . The passage b is provided at both ends with tubes b^2 , which admit external air to the passage for the purpose of assisting in the combustion of the gas. The gas-burner B consists of a vertical gas-tube, c , and an air-tube or nozzle, c' , arranged within the gas-tube and opening near the mouth of the gas-tube, as clearly shown in Fig. 1. The gas-burner receives the combustible gas from a gas-generator, D, which is arranged in a subterranean vault in rear of the furnace, and which is connected with the gas-pipe c by an elbow-pipe, d . The gas-generator D is composed of a gas-generating chamber, e , which is provided with a grate, e' , at the bottom and a feed-opening, e^2 , at the top, having a sliding cover, e^3 .

E represents a feed hopper or funnel arranged above the feed-opening e^2 , and pivoted to the top of the gas-generator, so as to be laterally movable toward and from the feed-opening. The chamber e is filled with short blocks of wood or other suitable material, which are ignited at the bottom of the chamber, while the wood in the upper portion of the chamber is distilled by the heat of the burning wood below and generates a combustible gas. The admission of air to the gas-generating chamber is controlled by suitable dampers, e^5 , in the ash-pit e^4 . The charges of wood are placed in the feeder E, with the wood resting upon the cover e^3 . Upon opening the latter the wood drops down into the generating-chamber e , and, this being accomplished, the cover is quickly closed. In this manner fresh wood is fed from time to time into the generating-chamber while the operation of cremation is going on. The gas-generator is preferably mounted on wheels, which run on rails, so that upon disconnecting the generator from the elbow-pipe d and air-pipe f' the generator can be moved to a more convenient or accessible place when required to be cleaned or repaired.

F represents an air-heating jacket, which incloses the generating-chamber e , and which forms an intervening air-passage, f , to which the external air is admitted at the bottom. The air becomes heated in passing through the jacket F by contact with the generating-chamber e , and is then conducted by the pipe

f' to the air pipe or nozzle e' of the gas-burner B. The chamber e thus forms at the same time an air-heating and gas-generating chamber.

5 g represents a pipe which admits external air to the gas-passage b above the gas-burner B. The flame and hot gases issuing from the burner B pass through the passage b , in which they are supplied with additional air from the
10 pipes b^2 and g and enter the cremation-chamber A through the openings b' . In passing through this chamber the gases are further supplied with additional air for combustion, which air enters through passages g' , arranged
15 in the side walls of the cremation-chamber. The openings b' and air-pipes b^2 g at the head of the chamber A converge and direct the flame upon the upper portion of the corpse, while the air-jets, entering through the side
20 passages, g' , direct the flame upon the lower portion of the body.

H represents horizontal return-flues arranged underneath the floor a^2 of the chamber A, and communicating with the latter at
25 their front ends by openings h , through which the gases dive into the flues H.

I represents gas-burners arranged in the front portions of the flues H, for the purpose of subjecting the gases which enter the flues
30 to a secondary combustion. Each burner I is provided with a horizontal gas-pipe, i , which is open at its inner or rear end, and which receives the gas from a vertical pipe, i' , to which the gas is supplied by a pipe, i^2 , from a manifold, i^3 , connected with the elbow-pipe d .

i^4 is a horizontal air-pipe, which is arranged within the gas-pipe i and admits external air to the mouth thereof for burning the gas issuing therefrom. An additional air supply en-
40 ters the upright pipe i' through an elbow-pipe, i^5 . The gases entering the flues H from the chamber A meet the flames and gases issuing from the burners I, thereby effecting a
45 secondary combustion and consuming any combustible matter contained in such gases.

The rear ends of the flues H turn inwardly and connect with the upper end of a diving-flue, J, which is connected by a horizontal flue, K, with the chimney L.

50 M represents a gas-burner arranged at or near the junction of the flue K with the chimney L, and receiving the gas from the manifold i^3 by a pipe, m .

n is an air-pipe, which supplies external air
55 to the gas-burner M for effecting the combustion of the gas. By this means the gases which escape from the flue K are subjected to a third combustion as they enter the chimney and before they escape into the outer air, thereby
60 still further reducing the possibility of any gases or vapors escaping into the outer air without being completely oxidized and rendered inodorous and harmless. The gas-burner M is preferably provided with a conical spread-
65 er, m' , for distributing the flame over the mouth of the flue K.

O represents small auxiliary furnaces ar-

ranged in the rear part of the cremation-furnace, on opposite sides of the gas-burner B, and communicating with the gas-passage b by open- 70
ings o . These furnaces are used for heating the cremation-furnace sufficiently to start the draft, and they may also be used between two cremating operations for preventing the apparatus from getting cold. 75

P represents the carriage upon which the corpse is placed before introducing the same into the cremation-chamber A. The carriage P is provided with wheels p , which run on rails placed in front of the cremation-chamber. 80
This carriage is also provided with rollers p' , upon which is placed the plate or slab which supports the corpse.

The operation is begun by starting a fire first in one and then in the other auxiliary furnace 85
O and urging these fires until the apparatus is sufficiently heated to light the gas at the burner B. While the fires are burning in the furnaces O gas is generated in the apparatus D, and when the temperature of the cremating-fur- 90
nace has been sufficiently raised the gas is ignited at the burners B, I, and M. The hot air which is supplied to the main burner B materially increases the temperature of the furnace. When the gas is burning, the fires in the aux- 95
iliary furnaces O can be extinguished. When the temperature in the cremation-chamber has risen to about 800° centigrade, the apparatus is ready to receive the corpse. The slides or
100 valves of the air-openings in the chamber A are now opened, the carriage P is moved against the front end of the oven, the door a' is opened, the corpse resting on the slab or plate is moved into the chamber A, and the door is closed. The progress of the operation 105
can be observed through side openings formed in the chamber A and covered with transparent panes. The intense heat to which the corpse is subjected and the supply of air to the chamber A effect in part a combustion and in 110
part a distillation of the corpse, and the gases and vapors resulting therefrom are further consumed by the second combustion effected by the burners I in the return-flues H, which burners also supply additional air to the gase- 115
ous mixture in the flues. The final combustion of any remaining unconsumed combustible matter is effected by the burner M in the chimney. When the operation of cremation is completed, the gas is shut off, the furnace 120
is permitted to cool, and the plate or slab containing the ashes is removed from the furnace.

If it is desired to conduct several cremations consecutively, the gas is shut off, the ashes are removed, and another corpse is introduced 125
into the chamber A and the gas turned on again. The gas and air pipes are provided with suitable dampers or valves for regulating the supply of gas and air.

The gas produces the necessary intense heat 130
in a comparatively short time, and does not cause an admixture of foreign substances with the human ashes.

The gas-generator herein described can be

advantageously used where a supply of combustible gas is not otherwise obtainable; but it is obvious that such gas derived from any other source may be used.

5 We claim as our invention—

1. In a cremation-furnace, the combination, with the oven, of a primary gas-burner whereby the oven is heated, a draft-passage through which the products of the primary combustion escape from the oven, and a secondary gas-burner arranged within said draft-passage, whereby the products of the primary combustion escaping from the oven are subjected to a secondary combustion, substantially as set forth.

2. In a cremation-furnace, the combination, with the oven, of a primary burner whereby the oven is heated, a draft-passage through which the products of the primary combustion escape from the oven, a secondary burner arranged near the inlet end of said draft-passage and effecting a secondary combustion, and a tertiary burner arranged in said draft-passage, and whereby the products of the secondary combustion are subjected to a tertiary combustion, substantially as set forth.

3. In a cremation-furnace, the combination, with the oven, of a primary gas-burner located at one end of the oven and provided with an air-supply conduit, a draft-passage through which the products of the primary combustion escape from the oven, and a secondary gas-burner located in said draft-passage and provided with a separate air-supply conduit, substantially as set forth.

4. The combination, with the oven A, of a primary burner composed of an air-supply conduit, *c'*, and a surrounding gas-conduit, *c*, an exit-flue, H, and a secondary burner arranged in said flue, and composed of an air-conduit, *h'*, and a surrounding gas-conduit, *i*, substantially as set forth.

5. The combination, with the oven A, of a primary burner composed of an air-supply conduit, *c'*, and a surrounding conduit, *c*, and an auxiliary air-supply conduit opening into the oven above said primary burner, substantially as set forth.

6. The combination, with the oven A, of a

primary gas-burner, B, a passage, *b*, connecting said burner with one end of the oven, return-flues H, arranged below the oven and connected with the opposite end thereof by openings *h*, and secondary gas-burners arranged in said exit-flues below the openings *h*, substantially as set forth.

7. In a cremation-furnace, the combination, with the oven, of a heating and gas-generating chamber, a gas-conduit connecting said chamber with the oven, an air-heating passage enveloping the said heating and gas-generating chamber, and an air-conduit conducting the heated air to the gas-burner in the oven, substantially as set forth.

8. In a cremation-furnace, the combination, with the oven, of a heating and gas-generating chamber, a gas-conduit connecting said chamber with the oven, an air-heating passage enveloping said heating and gas-generating chamber, and an air-conduit surrounding the gas-conduit and opening at the mouth of the gas-conduit in the oven, substantially as set forth.

9. In a cremation-furnace, the combination, with the oven, of a gas-conduit leading to the oven, an air-conduit conducting hot air to the gas-burner, means, substantially as described, whereby the air is heated, and a secondary air-passage admitting outside air to the gas-burner, substantially as set forth.

10. In a cremation-furnace, the combination, with the oven, of a gas-burner communicating with the oven, a descending draft-passage connecting the oven with a chimney, and an auxiliary furnace, O, communicating with the oven, substantially as set forth.

Witness my hand this 8th day of December, 1885, at Buffalo, New York.

GIUSEPPE GERONIMI.

Witnesses:

JNO. J. BONNER,

OSCAR SCHAUB.

Witness my hand this 24th day of December, 1885, at Milan, Italy.

GIUSEPPE VENINI.

Witnesses:

ADOLF RINDERKNECHT,

HERM. HEIM.